

APPENDIX B - LITERATURE DATABASE

Within the database, a scale is included as to the relevance of the literature in several categories. The symbols provided display the amount of relevance of the article to the following categories:

- CVISN
- ITS
- Customs
- State
- Federal
- International

Relevance is indicated by a numerical scale, as shown in Table 1.

Table 1 – Relevance Legend

Relevance Rating	Degree of Relevance
0	No Relevance
1	Slightly Relevant
2	Partly Relevant
3	Mostly Relevant
4	Fully Relevant

CVISN
CVISN Guide to Electronic Screening
March 2002

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
4	4	1	3	1	0

SIGNIFICANT FINDINGS
<ol style="list-style-type: none"> 1. Electronic screening is one of the three key program area in CVISN Level 1 2. There are a variety of technologies that can be applied to electronic screening in support of the commercial vehicle weigh and inspection process. There are also a number of ways in which these technologies can be applied (Dedicated Short Range Communications (DSRC), Weigh In Motion (WIM), Automatic Vehicle Classification (AVC), Vehicle Tracking Loops, Automatic Signing 3. Member states of two major multi-state electronic screening programs, Heavy Vehicle Electronic License Plate (HELP) PrePass and North American Preclearance and Safety System (NorPass), have deployed a number of sites that are currently in operation. The CVISN pilot and prototype states have completed or are in the process of developing electronic systems that meet CVISN Level 1 Requirements. 4. As of the date of this publication, states participating in HELP PrePass do not meet the CVISN Level 1 roadside requirements. The primary shortcomings are not using snapshot data as the basis for safety and credential checks and business policies which prevent national interoperability of electronic screening.

LESSONS LEARNED
<ol style="list-style-type: none"> 1. In making any decision for electronic screening, it is important to consider the motor carrier's interest, along with the state perspective. Participation by the motor carrier community is essential to achieve long-term success. 2. Carrier outreach should begin at the early stages of development in order to build support for the program

INSTITUTIONAL ISSUES
<p>Funding and contracting phase key decisions include:</p> <ul style="list-style-type: none"> • How much funding is required to complete the project? • Where will the funding be obtained? • How will operations and maintenance (O&M) costs be funded? • What type of procurement should be used for each product or service? • What can be done to expedite procurements? • What type of incentives and remedial mechanisms should be included in the contracts? • What software rights should be included in the contracts

OPERATIONAL ISSUES
<ol style="list-style-type: none">1. The application of electronic screening will be affected by many constraints, including site limitations, availability of support staff and funding. Each roadside check situation is likely to have a unique design due to state policy and practices; traffic flow, volume and number of lanes; available site space; legacy system characteristics; existing proprietary solutions; vintage of roadside facilities and communications equipment; resources available for making changes2. Another component to standardization of data exchange between state and/or public systems is the use of common data "snapshots." Snapshots contain information that provide a quick picture of carrier/vehicle/driver safety performance history and basic credentials information. Carrier and vehicle snapshots exchange safety and credentials data between state and national systems.3. Widespread participation in electronic screening programs is encouraged.4. Electronic screening is provided for vehicles equipped with FMCSA-specified DSRC transponders5. Screening systems are interoperable with those in different jurisdictions

ARTICLE SUMMARY / SYNOPSIS
The Johns Hopkins University Applied Physics Laboratory in conjunction with the U.S. DOT prepared this guide to provide reference information and to offer advice on implementing electronic screening functions in CVISN.

Arizona CVISN Top Level Design Description
8/29/02

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
4	4	0	4	0	0

SIGNIFICANT FINDINGS
<ol style="list-style-type: none"> 1. Arizona's CVISN Program is being led by the ADOT Motor Vehicle Division (MVD) and Information Technology Group (ITG). MVD is responsible for credentialing, electronic screening and program administration. ITG will manage all systems integration. 2. All stakeholders have expressed support of the CVISN program initiatives, which are designed to promote the following objectives <ul style="list-style-type: none"> • Improve highway safety • Improve state and motor carrier productivity • Streamline credential and tax administration • Improve regulatory compliance, thereby "leveling the playing field" for already compliant motor carriers 3. ADOT is committed to meeting CVISN Level 1 deployment requirements as well as implementing other projects that are not necessarily part of Level 1 Functionality as defined by FMCSA. 4. Arizona has established guiding principals for its architecture and design to include maintaining existing legacy systems, creating new systems when required, communications protocols will be used, and electronic communications will be done primarily through the Internet.

LESSONS LEARNED
None

INSTITUTIONAL ISSUES
<ol style="list-style-type: none"> 1. General Arizona issues that were documents as part of the CVISN process are: <ul style="list-style-type: none"> • Funding, need matching funds • Need commitment for team participation and structural organization • Program availability • Operations and maintenance funding • NAFTA issues and need to configure international border crossing port design ITS elements • Limited wireless communications transmission capabilities in sparsely populated areas of the state; limits connectivity for roadside officers. 2. NAFTA issues include: <ul style="list-style-type: none"> • Formalization of a federal-state presence at all six border crossings in Southern Arizona through the establishment of working covenants • Adoption of specific port improvement recommendations

- Collaboration between state and federal inspection authorities in the sharing of resources and the joint assignment of port inspectors
- Development of operational strategies and preparedness plans in concert with U.S. and Mexican Government officials and members of the private sector to fully implement the last phase of NAFTA

OPERATIONAL ISSUES

1. Arizona does not have wireless communications in place for real-time PIQ queries or immediate upload of inspections to the SAFER Data Mailbox (SDM) from the roadside. PIQ Queries and inspection uploads to the SDM can be accomplished from some fixed ports; however, many officers will continue to upload inspections to SafetyNet at the end of shift rather than to SDM.
2. Arizona has elected to use the Washington CVIEW, and the state will rely on Washington for its interface with SAFER, at least until SAFER is able to accept XML transmittals. Arizona does not plan to develop an interim EDI interface between its CVIEW and SAFER.
3. Arizona intends to allow IRP and IFTA credentials to print at carrier offices. The state and its vendors have not yet evaluated all of the possible issues associated with distributing plates, cab cards or IFTA decals for, in essence, carrier self-issue.

ARTICLE SUMMARY / SYNOPSIS

In following ADOT's commitment to improving commercial vehicle operations and services, they have provided this report to describe Arizona's CVISN design and deployment. It includes system requirements, system design, operating scenarios and issues with the system.

What Have We Learned About Intelligent Transportation Systems: Chapter 6 - What Have We Learned about ITS from Commercial Vehicle Operations? Status, Challenges, and Benefits of CVISN Level 1 Deployment
December 2000

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
4	4	0	2	2	1

SIGNIFICANT FINDINGS
<ol style="list-style-type: none"> Three Technology Areas Reviewed: <ul style="list-style-type: none"> Safety Information Exchange, Electronic Screening Electronic Credentialing. Safety Information Exchange Technologies - Provide more up-to-date safety data to enforcement in the field. Electronic Screening - Operational tests (Advantage I-75), HELP/Crescent (I-5) and Oregon Green Light) have demonstrated the technical feasibility and time-savings benefits of using electronic screening systems for Commercial Vehicle Operations (CVO) DSRC. Electronic Credentialing - offers opportunity for significant cost savings related to motor carrier registration process. Kentucky, has preliminary estimates of savings due to electronic credentialing can be as high as 75 percent. Deployment not at same level

LESSONS LEARNED
<ol style="list-style-type: none"> Collaboration among states in cooperation with Federal Government is key to success State Commercial vehicle enforcement agencies recognize this technology facilitates the inspection process and helps focus inspection resources on high-risk carriers. Programs developed by FMCSA such as CVISN Mainstreaming help to resolve deployment issues. Most states are depending on voluntary participation of motor carriers. The use of license plate readers for automated vehicle identification has not been successful because of low reliability. Carrier enrollment is heavily dependent on solving inoperability. Technical challenges between connecting new system with legacy systems. Several states underestimated the complexity of integrating old legacy system with new systems. Some states relied too heavily on outside contractors without providing agency technicians.

INSTITUTIONAL ISSUES
<ol style="list-style-type: none"> Type and amount of safety information for used during roadside inspections or for selecting vehicles for inspection will change as faster less costly wireless communications becomes available. Continued development and refinement of systems such as Aspen. States must determine criteria to use and must communicate the criteria to carriers and to a degree possible establish uniformity within key corridors. Motor Carriers can be expected to want same bypass criteria as vehicles travel from state to state.

3. Initially CVISN architecture focused on specialized computer-to-computer software. Web-based systems that allow carriers to conduct credentialing business were also being investigated.

OPERATIONAL ISSUES

1. States have encountered no major impediments to widespread deployment of deploy roadside computer with Aspen (software that records, processes inspection data and provides historical information on safety performance), Inspection Selection System (ISS).
2. DSCR transponders need to be compatible with other applications toll collections, and border crossing.
3. (1) Type of data communications that should be adopted. Two standards to use electronic data interface (EDI) of extensible Markup Language (XML). EDI is well established
4. (2) Type of software system (specialized computer programs or Web applications)

ARTICLE SUMMARY / SYNOPSIS

1. Three Technology Areas Reviewed: Safety Information Exchange, Electronic Screening, and Electronic Credentialing. Reviewed deployment status, technology benefits, issues to implementation, success of technology.
2. PrePass uses private capital for infrastructure. NorPass uses state-owned AVI infrastructure. Green Light is constructed and administered by Oregon DOT (Department of Transportation).

**Evaluation of the Commercial Vehicle Information System and Networks (CVISN)
Deployment Initiative
March 2002**

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
4	4	0	2	3	0

SIGNIFICANT FINDINGS
<ol style="list-style-type: none"> 1. CVISN can produce substantial costs savings for states and motor carriers, improve the efficiency and fairness of commercial vehicle operations, and most importantly, save lives. To achieve these benefits, CVISN must be deployed nationwide according to consistent standards and its major systems must be fully integrated. 2. The CVISN Inspection Selection System (ISS), used in combination with manual prescreening to select commercial vehicles for inspection, was demonstrated in limited field tests to increase the number of out-of-service (OOS) orders issued by 2 percent compared to traditional screening methods. 3. A crash avoidance model estimated that without electronic screening, the use of ISS would result in 84 fewer commercial vehicle crashes per year nationwide by removing unsafe vehicles and drivers from the roadway. Further analysis demonstrated that if ISS were combined with electronic screening approximately 600 commercial vehicle-related crashes could be avoided per year. 4. CVISN safety information exchange and electronic screening technologies can result in significant safety benefits, but only if these technologies are widely deployed, fully integrated, and combined with innovative enforcement and outreach strategies. 5. Annual operating costs to the states for credentialing can be reduced by almost 35 percent, offsetting the start-up costs to deploy CVISN. 6. At least 4 states (Maryland, Virginia, Kentucky, and Washington) have demonstrated Level 1 capabilities in all three areas, and many other states have made significant progress in one or two areas-eight of the 48 contiguous states have been fully funded to achieve Level 1 deployment by September 30, 2003.

LESSONS LEARNED
<ol style="list-style-type: none"> 1. Even though electronic credentialing has demonstrated the potential for significant cost savings, much needs to be done before these cost savings can be realized. Although there is a strong commitment from states to deploy electronic credentialing, only three or four states have achieved any level of success. This is because of the many technical challenges in integrating diverse computer systems. Also, the solution in one state might not be applicable to another because the systems differ from state to state. 2. The CVISN motor carrier survey suggests that most carriers are receptive to the idea of end-to-end electronic credentialing, but questions remain about how the carriers will communicate with the states electronically.

INSTITUTIONAL ISSUES
None

OPERATIONAL ISSUES
1. One of the major issues under consideration by the states as well as the FMCSA is whether to use computer-to-computer interfaces between the state and motor carriers or a web-based person-to-computer interface.

ARTICLE SUMMARY / SYNOPSIS
This report prepared by Battelle on behalf of the US Department of Transportation is an evaluation of the CVISN Model Deployment Initiative. This presents the goals, methods and findings of the independent evaluation of CVISN benefits and costs.

Memorandum of Understanding between The Arizona Dept of Transportation (ADOT) and The Az Dept of Public Safety, US Customs Service (USCS), US Dept of Agriculture (USDA), US Dept of Transportation (US DOT) - Federal Motor Carrier Safety Administration (FMCSA), US General Services Administration (USGSA), Expedited Processing at International Crossings (EPIC) Phase 2, Commercial Vehicle Operations/Traffic Management System, Nogales, Arizona POE - Mariposa Federal and State Complexes
August 2002

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
4	4	2	2	2	2

SIGNIFICANT FINDINGS
<ol style="list-style-type: none"> 1. Slow Weigh in Motion (SWIM) is already in place. Epic will integrate and store SWIM and AVI information to link the weight information with vehicle identification. U.S. Customs uses digital CCTV will expand to include additional cameras/server for ADOT and other regulatory agencies. Automated Vehicle Identification System (AVI) - all data collected in the compound will be linked to the proper vehicle and driver. 2. Dynamic Message Signs (DMS) will be installed within compound to assist with the traffic management and control. Digital Imaging Equipment captures images of vehicles and drivers as they are tagged (vehicle numbers, wheels, lug nuts). Database System store all data gathered in compound. Data is from various electronic and keyed entries. Communication System Fiber optics and twisted pair copper wire connect the LAN between buildings, includes ITS field controllers and cabinets

LESSONS LEARNED
None

INSTITUTIONAL ISSUES
None

OPERATIONAL ISSUES
None

ARTICLE SUMMARY / SYNOPSIS
<ol style="list-style-type: none"> 1. The Memorandum of Understanding provides the framework and guidelines to promote and coordinate the project development, implementation, and operations/maintenance of ITS technologies at the Nogales Port of Entry for commercial vehicles. 2. Goal: enhance the overall efficiency and effectiveness of commercial border-crossing operations and reduce impacts on institutional and legal barriers. 3. Objectives: (1) Implement electronic and high-tech commercial vehicle processing systems. (2) Deploy ATMS (3) Provide info dissemination system for vehicle and driver.

CVISN - Executive Summary Model Deployment Initiative (MDI) Summary Evaluation Plan
John Orban (Battelle) Daniel Brand (Charles River Associates) SCOTT Amey (RS Information System) John Kinatader (Battelle)
July 1998

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
4	4	0	3	0	0

SIGNIFICANT FINDINGS
<ol style="list-style-type: none"> Key features deployed: Credentialing Administration - (1) End-to-end electronic application and processing of credentials (electronic submittals, direct links to legacy systems, edit checks, fee calculation, invoice generation, fund transfer, and production of credentials). (2) Use of PC versus Web for Carrier Automated Transaction System (CATS) for credential applications submission. (3) Printing credentials (permanent or temporary) if carrier offices. Especially for oversize/overweight. (4) Interface with International Registration Plan (IRP) and International Fuel Tax Agreement (IFTA) clearinghouses. Roadside Enforcement (Electronic Screening and Safety Information Exchange) - (1) Mainline screening for weight, credentials, and safety. (2) Sorter Lane screening using AVI. (3) Mobile units equipped with networked screening data, (4) Real-time access to screening data at fixed sites and in mobile units (5) Facilities for screening on bypass routes.

LESSONS LEARNED
<ol style="list-style-type: none"> Evaluation strategy identified safety benefits rated the highest importance, next was efficiency. Mobility productivity, and energy/environment, in that order were rated lower.

INSTITUTIONAL ISSUES
None

OPERATIONAL ISSUES
None

ARTICLE SUMMARY / SYNOPSIS
Demonstrates the technical and institutional feasibility, costs, and benefits of the primary Intelligent Transportation systems (ITS) user services for commercial vehicle operations (CVO) and to encourage further deployment of these services

INTELLIGENT TRANSPORTATION SYSTEMS

Intelligent Transportation Systems at International Borders – A Cross-Cutting Study,

April 2001

APRIL 2001

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
4	2	0	2	3	0

SIGNIFICANT FINDINGS

1. The International Border Clearance Program (IBC) has led to the development of interfaces with state commercial vehicle information systems being developed and deployed under the FHWA ITS/Commercial Vehicle Operations (CVO) program.
2. The IBC vision—The seamless, harmonized, and timely clearance of international commerce between and through trading countries resulting in safe and legal commercial operations

ARTICLE SUMMARY / SYNOPSIS

The purpose of the study was to identify examples of how IBC has made progress toward its goals of facilitating trade and enhancing safety. The study represents findings from field operational test (FOT) evaluation reports, and during interviews with federal, state, and industry officials at six border crossing sites, including Nogales, AZ. This study was performed by the U.S. DOT - Federal Highway Administration and Federal Transit Administration.

BORDER CROSSING FACILITY AT BLAINE, WA

LESSONS LEARNED

1. Competing CVO electronic screening cooperatives prevent progress toward international interoperability.
2. Planners should develop long-term, sequential deployment schedule that allows for incremental funding and demonstration of capabilities.
3. Non-traditional partnerships are not fully accommodated by the state planning process.

INSTITUTIONAL ISSUES

1. State and Federal transportation and custom agencies have different roles and focus areas.
2. Obtaining funding for and conducting coordination of property and infrastructure improvements related to transportation in non-transportation compounds is complex.
3. Traditional funding agreements are not universally applicable, requiring creativity and flexibility, particularly with regard to multiple currencies and procurement laws.

OPERATIONAL ISSUES

1. Limited knowledge regarding life-cycle, operations, and maintenance costs of technology improvements makes obtainment of funding commitments difficult.

BUFFALO, NY--PEACE BRIDGE

LESSONS LEARNED
<ol style="list-style-type: none">1. The system installed at the bridge has the potential to improve the level of service to both freight providers and people crossing the bridge into the U.S.2. Because expediting the flow of traffic is a goal not always consistent with the missions of agencies responsible for regulating cross-border movements, seamless cross-border movement is not a universally shared priority.

INSTITUTIONAL ISSUES
None

OPERATIONAL ISSUES
<ol style="list-style-type: none">1. With no U.S weigh scales on the Canadian side, trucks exceeding the bridge weight limits will cross unimpeded.2. Increasing trade volumes, road access design issues and limited space combine to create significant congestion

DETROIT, MI—AMBASSADOR BRIDGE (THE SYSTEM USED FOR THIS BRIDGE IS THE AMBASSADOR BRIDGE INTERNATIONAL BORDER CROSSING SYSTEM (ABBCS))

LESSONS LEARNED
<ol style="list-style-type: none">1. Systems installed as part of the field operational test (FOT) proved the technical feasibility of expedited border crossings.2. Simulation results indicate that the Dedicated Commuter Lane concept has the potential to positively impact traffic on the bridge, provided all equipped lanes are open to all vehicles

INSTITUTIONAL ISSUES
<ol style="list-style-type: none">1. Multiple agency points of contact for statewide CVO make it difficult to obtain uniform guidance from agencies responsible for administration and enforcement.2. Legal requirements in Michigan do not yet allow the selection of high risk vehicles and drivers for inspection using electronic records, which is counter to the ITS/CVO objective to target high-risk carriers.

OPERATIONAL ISSUES
<ol style="list-style-type: none">1. Space constraints prevent vehicle safety and compliance inspections from being conducted on the bridge facility and support development and use of FTPS and CVISN.

LAREDO, TX PORT OF ENTRY

LESSONS LEARNED
<ol style="list-style-type: none">1. Limited resources are available to the TX DPS for facilities, technology, implementation and staffing.2. Laredo has multiple high-volume crossings, which demand innovative technological solutions.3. Laws permit the application of discretion in selecting vehicles for inspection.4. Large trade volumes and limited enforcement resources make Laredo well suited for FTPS and ITS/CVO technology implementations.5. The largest improvements at Laredo crossings will come from replacing the drayage system that has been institutionalized between the US and Mexico distribution centers.

INSTITUTIONAL ISSUES
None

OPERATIONAL ISSUES
None

NOGALES, AZ PORT OF ENTRY

LESSONS LEARNED
<ol style="list-style-type: none">1. The EPIC system has the potential to significantly reduce the amount of time spent in the border compound.2. Utilizing the Superbooth reduced the average approximate travel time through the compound by over 80%.

INSTITUTIONAL ISSUES
<ol style="list-style-type: none">1. Insufficient financial resources preclude the operation to fixed weigh stations at all ports.2. State representatives support technological innovation to facilitate faster processing and enhance safety.

OPERATIONAL ISSUES
<ol style="list-style-type: none">1. There is no hazardous materials containment area at any of the existing Arizona ports (one site planned at time of study)

OTAY MESA, CA PORT OF ENTRY

LESSONS LEARNED
<ol style="list-style-type: none">1. The layout of an international border compound and the operations within it, present a challenge in implementing current DSRC systems in a border environment2. Test results indicate that an RF (radio frequency) network is capable of supporting basic information exchange requirements; it is unclear whether higher transaction volumes could be sustained.3. Participant carriers indicated they saw potential for IBEX technologies to enhance operations, but that improvements to surrounding processes would be necessary.

INSTITUTIONAL ISSUES
None

OPERATIONAL ISSUES
<ol style="list-style-type: none">1. The initial investment associated with equipping vehicles with transponders was considered acceptable, provided that processing paper-based transactions in parallel was eliminated.2. Participating carriers believed that as congestion at the border increases, participation in automated preclearance programs will make the difference in the efficiency and competitiveness of their operations.

**Interim Report on Customs Automated Commercial Environment (ACE) Program
Management: Customs Needs to Adequately staff Modernization Office
March 4, 2002**

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
0	0	4	0	4	4

SIGNIFICANT FINDINGS
1. Purpose of the report is to recommend improvements to the management of the ACE development. Program still in Requirements and Planning Phase.

LESSONS LEARNED
None

INSTITUTIONAL ISSUES
1. 9/11/2001 increased the planning needed for the requirements. International Trade Data System (ITDS) is not being incorporated as a Task order for ACE. ACE development schedule is reduced to four years.

OPERATIONAL ISSUES
None

ARTICLE SUMMARY / SYNOPSIS
Recommend improvements in the management of the Automated Commercial Environment (ACE) development.

**Ambassador Bridge Border Crossing System (ABBCS), Field Operational Test
May 2000**

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
4	0	0	2	0	4

SIGNIFICANT FINDINGS
<ol style="list-style-type: none"> 1. The systems installed as part of the operational test demonstrated that the provision of expedited border processing was technically feasible. 2. According to the results of a detailed simulation conducted by Mitretek Systems, the implementation of a system like the ABBCS, in combination with a carefully selected lane assignment scheme has the potential to significantly reduce the length of vehicle queues during peak arrival periods. 3. At the most basic level, this program demonstrated that it is possible for law enforcement officials at or near the border to access information regarding specific vehicle, carrier, operator, and cargo data that was not previously available. 4. Due to the nature and duration of the operational test, it was expected that any benefits that would be likely to accrue to bridge users and other stakeholders would not necessarily be immediately apparent. Specifically, because import processing using ABBCS was conducted in parallel with, rather than in place of current processes, bridge users were more likely to experience additional workload and delay than any efficiency benefits. 5. Survey and interview findings clearly indicate that the willingness of bridge users to enroll in and use ABBCS and SENTRI/DCL systems is a direct function of the amount of direct benefit they expect to accrue.

LESSONS LEARNED
<ol style="list-style-type: none"> 1. The most significant technical lessons pertained to transponder battery life, and Dedicated Commuter Lane (DCL) card reader environmental sensitivity. 2. Reconfiguring the compound entry to accommodate two lanes of truck traffic would be likely to have a much more profound effect on traffic than the implementation of ABBCS.

INSTITUTIONAL ISSUES
<ol style="list-style-type: none"> 1. Information management: the primary issue here stems from concern on the part of the carrier community regarding the collection, use, and protection of information not specifically required by law, and liability regarding inaccurate data. This issue is not unique to the border environment, and receives regular attention in most ITS or CVO forums. 2. Inter-jurisdictional coordination: the significant issues here involve the adoption and use of standards that promote interoperability, particularly with regard to Dedicated Short Range Communications (DSRC), and the issues of sharing information across jurisdictions. These issues are significant, but they also enjoy considerable visibility among the stakeholders. 3. Sustainability: this refers to the ability of the ABBCS and similar systems to provide incentives significant enough to attract users, and thus become a worthwhile investment of public and private funds.

OPERATIONAL ISSUES
None

ARTICLE SUMMARY / SYNOPSIS
<p>The purpose of this field operational test (performed by Booz Allen Hamilton) was to demonstrate the ability of ITS technology and to expedite safe and legal international border crossings for both commercial and commuter vehicles in an operational environment. The objective was to develop and demonstrate an integrated system that would allow pre-processed vehicles, trade goods, and commuters to pass through international border check points quickly and efficiently.</p>

GAO Customs Service Modernization Management Improvements Needed on High-Risk Automated Commercial Environment Project
May 2002

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
4	0	2	0	2	0

SIGNIFICANT FINDINGS
<ol style="list-style-type: none"> 1. Customs' February 2002 ACE spending plan is the second in a series of legislatively required plans. This plan covers certain project management tasks as well as the definition, design and development of the first ACE increment. GAO found that the plan meets the legislative conditions that Congress imposed on Customs and is consistent with GAO's open recommendations. Nevertheless investment in ACE is a high-risk endeavor. 2. The system's size, performance parameters, and organizational impact make it technically and managerially complex. 3. Customs fell short of key commitments made in its first spending plan because it severely underestimated costs. 4. Customs needs to update its enterprise architecture to support system design and development. 5. Customs is taking a schedule-driven approach to acquiring ACE. However, without the management capacity to effectively acquire such a large and complex system, this approach could backfire. 6. Full system capabilities may take longer and cost more to acquire, deploy and make operational, because the system delivered under the accelerated schedule could require considerable rework.

LESSONS LEARNED
<ol style="list-style-type: none"> 7. To increase the chances of delivering needed system capabilities on time and within budget, GAO is making recommendations to the commissioner aimed at improving Customs' management of ACE, including strengthening system alignment with Customs' enterprise architecture, cost estimating, human capital capacity, software process maturity, and sequencing of incremental releases.

INSTITUTIONAL ISSUES
None

OPERATIONAL ISSUES
None

ARTICLE SUMMARY / SYNOPSIS
<p>The US Customs Service is in the early stages (May 2002) of a multiyear, multibillion-dollar project: the Automated Commercial Environment (ACE), a new import processing system that is to support effective and efficient movement of goods into the United States. By Congressional mandate, Customs' spending plans for ACE must meet certain conditions, including being reviewed by GAO. In this study, GAO addresses whether Customs' latest plan satisfies congressional conditions and is consistent with open GAO recommendations, and it identifies opportunities for strengthening project management.</p>

Arizona PRISM Implementation Project Plan
April 3, 2000

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
4	0	0	4	0	0

SIGNIFICANT FINDINGS
<ol style="list-style-type: none"> 1. PRISM will help to provide valuable resources to promote and monitor the safety of commercial carriers. 2. Arizona planned to implement the project for interstate vehicles initially, however DPS expressed concerns over the safety compliance of intrastate carriers as well. 3. The plan allows for the cross utilization of some resources and the phase in of intrastate carriers by requiring the use of the USDOT numbers for all interstate carriers and including these carriers in the local PRISM census file. 4. One full-time employee will serve as an expert in the MCMIS database. 5. The plan calls for the enhancement of three databases--TransPort System, which issues permits at Ports of Entry; the Title and Registration (T&R) System, which houses all vehicle and carrier/individual information; and VISTA, the IRP database, which interfaces with T&R. 6. Installation of 4 license plate readers is also included. 7. The project plan calls for Registration Requirements and Enforcement Requirements covering participant identification, staff and participant training.

LESSONS LEARNED
None

INSTITUTIONAL ISSUES
None

OPERATIONAL ISSUES
None

ARTICLE SUMMARY / SYNOPSIS
The Arizona Department of Transportation entered into an intergovernmental agreement with the Department of Public Safety to ensure the continued cooperation and completion of the PRISM project. This Implementation plan provides all the details on how PRISM will take shape.

EXPEDITED PROCESSING and International Crossing (EPIC) Test & Evaluation Strategy
February 5, 1996

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
4	0	0	3	4	2

SIGNIFICANT FINDINGS	
<ol style="list-style-type: none"> 1. The objective of the EPIC Project is to expedite commodity movements through the extensive use of Electronic Data Interchange (EDI) and the automation of manual process currently used to monitor commercial vehicle movements at the border. 2. The Commercial Vehicle Electronic Clearance User Service will be the focus of this operational test. 3. Systems that will be used include: <ul style="list-style-type: none"> • EDI • Vehicle Roadside Communications • Commercial Drivers License Information System (CDLIS) • License Plate Recognition (LPR) • Weigh In Motion (WIM) • SafetyNet • Management Information System for Transportation (MIST). 4. Services it will provide include: <ul style="list-style-type: none"> • Driver Processing • Vehicle Processing, • Cargo Processing • Traffic Management 5. The EPIC work plan is comprised of 5 sequential phases to achieve early/incremental accomplishments <ul style="list-style-type: none"> • Phase 0 - Initiation • Phase 1 - System Prototyping • Phase 2 - Trip Permitting Implementation • Phase 3 - Cargo Seals and WIM Implementation • Phase 4 - Traffic Management System Implementation 	

LESSONS LEARNED
None

INSTITUTIONAL ISSUES
None

OPERATIONAL ISSUES
<ol style="list-style-type: none">1. Can advanced technologies be applied in such a way to make it possible for commercial vehicles to cross international borders without stopping?2. Can common international border crossing processes and information requirements be developed and implements between the U.S. and Mexico?3. Will border inspectors allow electronic systems verifications of cargo, driver, and vehicle entry and exit requirements to replace manual process, except in the case of random inspections?

ARTICLE SUMMARY / SYNOPSIS
This FHWA presentation is stating that the EPIC project will demonstrate an electronic trip clearance system to accelerate commercial vehicle traffic through the Nogales, Arizona border crossing site.

**DRAFT VERSION D.2, Commercial Vehicle Information Systems and Networks (CVISN),
International Border Clearance (IBC) and National ITS Architecture Alignment
December 2001**

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
4	2	0	0	2	2

SIGNIFICANT FINDINGS
1. FHWA and FMCSA determined that a separate IBC Architecture will not be maintained and that the National ITS Architecture shall govern IBC-related deployments.

LESSONS LEARNED
1. Changes to the CVISN Architecture described in this document are necessary to bring it into alignment with the National ITS Architecture, including the National ITS Architecture's IBC components.

INSTITUTIONAL ISSUES
1. If a new user service requires intermodal functions be added to the National ITS Architecture, then the existing intermodal architecture flows are likely to be modified. As these and other flows are added and/or modified, the National ITS and CVISN Architecture teams will coordinate changes to that the architectures remain aligned.

OPERATIONAL ISSUES
None

ARTICLE SUMMARY / SYNOPSIS
Describes the changes made to CVISN Architecture resulting from the three-way alignment of National ITS, CVISN, and IBC Architectures.

**International Border Electronic Clearance (IBEX) Test and Evaluation Strategy
February, 1996**

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
4	0	0	2	1	2

SIGNIFICANT FINDINGS
<ol style="list-style-type: none"> 1. The objective of the CVO Preclearance System for International Border Crossings is to provide accredited service to both the border officials/agencies and commercial fleet users that allows selected vehicles to pass the international border check points without stopping, or with expedited inspections. 2. The heart of the IBEX system is the in-vehicle data processing interface unit, or DPIU. 3. The IBEX Project will require the integration of existing technologies into a seamless system that meets the operating and institutional requirements of both the U.S. and Mexico.

LESSONS LEARNED
None

INSTITUTIONAL ISSUES
None

OPERATIONAL ISSUES
None

ARTICLE SUMMARY / SYNOPSIS
This FHWA presentation is relaying the thought that the IBEX project will demonstrate an electronic border clearance system to accelerate commercial vehicle traffic through the Otay Mesa, California crossing site.

Advantage I-75 Mainline Automated Clearance System (MACS)
August 1998

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
4	0	1	3	0	0

SIGNIFICANT FINDINGS
<ol style="list-style-type: none">1. The objective of the Advantage I-75 MACS operational test is to permit compliant transponder-equipped trucks to travel any segment of the I-75 and Highway 401 corridor at mainline speeds while being cleared to bypass the weigh stations along the corridor.2. Goals of the project include:<ul style="list-style-type: none">• To increase industry and state productivity• To improve safety• To reduce congestion3. While the fuel savings generated from a single stop were minimal, the accumulated benefit from reduced stops at a weigh station were significant.4. The principal conclusion from this experiment is that there are measurable time savings obtained by electronic screening of commercial vehicles.

LESSONS LEARNED
<ol style="list-style-type: none">1. In order to facilitate the implementation of the system, technical standards and information sharing must be agreed to early on in the project and there must be "buy-in" from upper management in order to succeed.

INSTITUTIONAL ISSUES
None

OPERATIONAL ISSUES
None

ARTICLE SUMMARY / SYNOPSIS
<p>The Center for Transportation Research and Education at Iowa State University prepared this report on the Advantage I-75 MACS. It details the evaluation, consisting of four tests to determine the effectiveness of electronic clearance of commercial vehicles at weigh stations. The tests are fuel consumption, a weigh station throughput test, a simulation model and an examination of jurisdictional issues.</p>

**Oregon Green Light CVO Evaluation Final Report
April 2001**

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
4	0	0	3	0	0

SIGNIFICANT FINDINGS	
1.	Through Green Light, Oregon has installed twenty-one mainline systems featuring weigh-in-motion (WIM) devices and automatic vehicle identification (AVI) at the major weigh stations and ports-of-entry in the state.
2.	It is important to note that over the course of the evaluation period, from January 1998 to July 1999, there was a low transponder penetration in relation to the total traffic bypassing the Green Light facility at Woodburn POE. At the end of the data collection period for this study in July 1999 there were approximately 3000 transponders in the field, less that the amount needed to actually show a change in compliance as a result of Green Light. This number increased substantially to over 10,000 transponders in the field in July 2000. Green Light bypasses also increased dramatically from about 28,000 in July 1999 to approximately 60,000 by July 2000.
3.	The simulation findings indicate that electronic screening will reduce travel time and fuel consumption for trucks participating in the electronic screening programs, or transponder equipped trucks. Findings also indicate that electronic screening will decrease the occurrence of unobserved bypasses resulting from full queues and increase the percentage of trucks being screened for safety and compliance.
4.	The Green Light Project was initiated in 1995 to fulfill Oregon's visions of creating an automated and intelligent truck transportation system. As the project near completion, it has proved successful, by improving the safety and efficiency of the commercial trucking industry while at the same time increasing the performance of roadside facilities without physically expanding them, and protecting the public investment in the infrastructure.
5.	By implementing Green Light systems, Oregon identified and stopped more overweight trucks than previously. Without Green Light, these trucks would proceed with the potential to cause millions in highway pavement damage.

LESSONS LEARNED	
1.	Operating a heavy truck has been estimated by the ATA to cost \$1.92 per mile. Assuming an average hourly speed of 39 miles-per-hour, a cost of \$1.24 per minute is realized. Truck drivers save at least three minutes per weigh station bypass. Therefore it is conservatively projected, based on the current rate of about 60,000 bypasses a month in Oregon, that in the next 10 years the Green Light mainline system is expected to pre-clear 7.2 million trucks. This will save the industry more than \$25 million in operating costs as it save 360,000 hours of travel time. However, it is anticipated that the number of bypasses will increase substantially as more carriers enroll, resulting in much larger savings.

INSTITUTIONAL ISSUES
None

OPERATIONAL ISSUES
None

ARTICLE SUMMARY / SYNOPSIS
<p>This report, prepared by the Transportation Research Institute (Oregon State University), presents a summary of the findings of all the Detailed Test Plans conducted for the evaluation. Each of the goals addressed one of five goals, including:</p> <ul style="list-style-type: none"> • Assessment of safety • Assessment of productivity • Assessment of user acceptance • Assessment of mainstreaming issues • Assessment of non-technical interoperability issues

**International Border Electronic Clearance - IBEX, Evaluation Report
July 1998**

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
4	0	1	2	3	4

SIGNIFICANT FINDINGS	
1.	The implementation of systems such as IBEX and NATAP represent positive change from a border operations perspective, and potentially negative change from the perspective of commercial interests.
2.	The RF local area network (LAN) used during the test functioned well, in spite of concerns regarding reliability and potential interference. This type of network continues to offer the necessary connectivity in instances where port disruption due to construction must be minimized. The Type III transponders used for the test functioned reasonably well. The transponder power source is one important discriminator in overall performance within a DSRC rich environment where extended exposure to instruments is likely.
3.	The IBEX Operational Test provided the trade community and regulatory agencies with services and technologies that demonstrated electronic solutions to current border crossing and commercial vehicle safety processes.
4.	The purpose of the Traffic Facility Integrated Communications (TRAFIC) subsystem was to provide the capability to read the transponders on approaching vehicles, pass the received information to external systems, control the Customs inspector interface and relay the inspector actions to the external system, and finally to control the traffic signal in response to messages from the external system or the inspector action.
5.	The on-vehicle dedicated short range communications (DSRC) consisted of a Hughes Type III transponder--the purpose was to provide a DSRC information exchange media that stored information and provided that information upon demand to DSRC readers at regulatory agency decision points. The transponder stored or provided information specific to the vehicle on which was installed, in addition to other required information such as driver, carrier, and cargo data.

LESSONS LEARNED
<ol style="list-style-type: none"> 1. The early interface of the IBEX computer system with the US Treasury LAN at the custom's compounds was an area of concern for those administering Treasury's network. The concern was alleviated by the installation of a remote server and local NATAP client that also performed as a firewall for interfacing systems, such as the IBEX TRAFIC hub. TRW network outages periodically caused drop-outs in the exchange of data and information between the Customs' system and the TRAFIC hub. 2. Chain link metal fencing is reported to interfere with antennae performance. The position of antennae and their respective read zones in conjunction with metal fencing needs to be considered prior to installation. Mounting of antennae on existing infrastructure is not always the best solution for optimum performance. Separate supports that place the instruments at locations that provide for optimal performance should be considered prior to installation.

INSTITUTIONAL ISSUES
<ol style="list-style-type: none"> 1. International border business has been created based on inefficiencies in the border crossing system. There are many interdependent relationships, such as that between the drayage operators and the customs brokers. If all this border business went away, there would be serious economic impacts along the border regions. There is a need to identify what would be serious economic impacts on the border communities and identify some means to mitigate adverse impacts without hampering efforts to improve efficiency of process. 2. Two major government entities provided instruction, guidance, oversight and funding toward the IBEX project--US Treasury Dept and US Dept of Transportation--and each had a somewhat different focus. Treasury's primary mission was to track movements across the international border for accurate trade information and to minimize contraband. US DOT's primary mission was to ensure safety of vehicles, drivers and the public while facilitating international goods movement. Coordination is needed to ensure that standards, protocols, and approaches pursued in each effort do not create unnecessary hardships for the creation of other border systems and participation in border processes.

OPERATIONAL ISSUES
<ol style="list-style-type: none"> 1. With processes so heavily instituted into the border crossing business, some process change will be required in order to improve efficiency and improve integration of technology into the changing processes. There is a continued need to explore ways for businesses to file required paperwork to provide the information necessary for border clearance in as efficient a means as possible. Even with the introduction of technology solutions, businesses are still doing things the old way. Public and private systems need to be sufficiently integrated in order to remove the need for parallel processing and add real value to the expedited border crossing process.

ARTICLE SUMMARY / SYNOPSIS
<p>This is an evaluation of the International Border Electronic Crossing (IBEX) system implemented in an operational test. Its intent was to demonstrate the integration of electronic information systems and technologies aimed at facilitating the safe, efficient movement of goods between the United States and Mexican North American trading partners.</p>

Coutts / Sweetgrass Automated Border Crossing Phase I
March 1999

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
4	0	2	2	2	4

SIGNIFICANT FINDINGS					
<ol style="list-style-type: none"> 1. For an automated border crossing system to work effectively, close cooperation is needed between the various agencies involved with border crossing activities on both sides of the border. 2. To encourage inter-jurisdictional coordination, one must have a clear understanding of the stakeholders involved with commercial vehicle operations and their respective roles. Numerous regulatory and enforcement agencies can be involved in international border crossing activities. Involvement from transportation, customs and immigration, and other agencies occurs to differing degrees. Industry is also a major stakeholder with respect to international border activities. 3. Following each Oversight Committee meeting, the Western Transportation Institute (WTI) would have contacted members of the Oversight Committee to survey their knowledge and understanding of this project. These survey results would not have been statistically analyzed because of the small sample and potential bias resulting from such a targeted sample. However, these survey results would have provided MDT and WTI insight as to their agencies' effectiveness in involving project constituents. 4. The CVISN initiative and the Mainstreaming initiative will support technology deployment in the areas of safety assurance, credentials administration, electronic screening, and carrier operations. CVISN will provide the technical infrastructure to link these projects and information systems, including common standards and electronic communication among participating agencies and carriers. The Mainstreaming initiative will provide the organizational infrastructure to support ITS/CVO deployment including state and regional ITS/CVO forums and business plans. 5. A primary CVISN goal is to ensure that the vast majority of CVO business transactions are handled electronically by the year 2005. To achieve this primary goal, the CVISN Model Deployment Initiative is underway to move the CVISN architecture from the concept stage into operation. 6. The International Border Clearance Program (IBC) is a federally sponsored program that provides a focused effort to implement ITS/CVO technologies at international borders. The objectives of the IBC program are to: <ol style="list-style-type: none"> 7. Streamline border clearance regulatory and enforcement process 8. Reduce the information burden on private industry 9. Deploy ITS technologies that are interoperable between IBC functions and transportation functions 10. Achieve repeatable and predictable IBC operations 					

11. Realize cost effective solutions that easily integrate with existing public and private infrastructure and minimize investment by the various stakeholders
12. The North American Trade Automation Prototype (NATAP) is a national program that brings together Customs border crossing regulatory and enforcement activities at a national level. NATAP attempts to standardize the processes that occur when a vehicle enters or exits the US from a Customs perspective. It is a model for how customs will be processed in the future. Nogales POE was one site where NATAP efforts were initially focused.

LESSONS LEARNED

1. ITS/CVO implementation has been prevented or significantly delayed by the lack of standards for a wide range of subjects:
 - In-vehicle/on-vehicle devices
 - Communications protocols (both between vehicles and the roadside and between different jurisdiction computers)
 - Data formats
 - Forms and procedures
 - Information collection and data transfer
 - Penalties for non-compliance

INSTITUTIONAL ISSUES

1. In general, ITS/CVO challenges relate to the following:
 - Differing perspective and philosophies
 - Legislative, regulatory, and organizational limitations
 - Lack of motivation and leadership
 - Communications
 - Funding and resource limitations
 - Automation constraints
 - Standards

OPERATIONAL ISSUES

None

ARTICLE SUMMARY / SYNOPSIS

1. This project was intended to result in a fully automated international border crossing facility that addressed regulatory and enforcement needs of the Montana Dept of Transportation, Alberta Transportation and Utilities, US and Canadian Customs, and US and Canadian Immigration and Naturalization, while improving the operational efficiency of the commercial vehicle industry utilizing this crossing.
8. This report was to document the full Phase 1 implementation process. However, challenges of an institutional nature prevented the successful completion of Phase 1 and precluded the continuation of efforts into subsequent project phases. This report includes a description of proposed project methodology, a summary of national initiatives and site-specific efforts, a description of institutional challenges and conclusions and recommendations.

**EPIC Expedited Processing at International Crossings - Evaluation Final Report
September 1998**

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
4	0	1	4	1	3

SIGNIFICANT FINDINGS
<ol style="list-style-type: none"> 1. The original EPIC scope of work was changed several times in response to infrastructure and regulatory changes. These changes affected both the EPIC implementation and the evaluation process. These changes included: US Customs withdrawal from EPIC, Infrastructure changes, and Arizona regulatory changes. 2. The EPIC solution combined proven, low cost technology (through the use of existing commercial vehicle operations software) and the use of the Internet to provide a blend of expedited processing and compliance monitoring. 3. Each truck that participated in EPIC was equipped with a transponder mounted on the inside of the windshield. An identification number was then read by an automated vehicle identification (AVI) reader at the Mariposa compound to identify the truck, activate the EPIC system and communicate with the driver. 4. The EPIC partners of ADOT, Lockheed Martin IMS, and the American Trucking Associations Foundation, identified and recruited companies and drivers. Companies were identified through meetings with the brokers' association and direct company contacts. 5. In addition to issuing single trip permits, EPIC provided other informational services accessed via the EPIC web pages, including: shipment notification, Mariposa traffic conditions, individual truck information. 6. In general, it appears as though the EPIC concept did have the potential to lessen the processing time for vehicles through the compound area, and therefore reduce vehicle travel time for the compound design and traffic flow pattern that existed when the system technology design was first conceived. The EPIC test did not provide an ideal environment for the quantitative analysis of travel time through the compound area and as assessment of the impact of EPIC on travel time.

LESSONS LEARNED
<ol style="list-style-type: none"> 1. The pre-clearance of vehicles to use the SuperBooth and avoid entering the compound had the single most dramatic impact on travel time through the compound area for commercial vehicles. This feature alone reduces travel time by approximately 25 minutes on average (83 percent) in comparison to entering the compound for transponder equipped vehicles not using EPIC. EPIC vehicles using the SuperBooth had a 21 percent lower travel time than the non-EPIC vehicles that participated in the test (on average, approximately a one minute time savings). 2. The physical and operating conditions of the FOT need to be controlled and held constant during the design implementation and evaluation phases of the test. When it is not possible to control changes, their effect on the system design and the evaluation process should be communicated to the FOT participants. 3. The data collection plan for the evaluation should not rely entirely on the FOT technologies to provide the required data. At a minimum, the evaluation design should be considered when developing the system design.

INSTITUTIONAL ISSUES
None

OPERATIONAL ISSUES
None

ARTICLE SUMMARY / SYNOPSIS
<ol style="list-style-type: none"> 1. The EPIC focus was on the commercial vehicle transport component of international border crossings at the Nogales, Arizona POE. Commercial vehicle transport included state border crossing requirements of motor carriers, trucks, trailers and drivers. The goal for EPIC was to expedite the border crossing process by 1) providing for electronic pre-clearance for State of Arizona entry requirements of carriers and drivers and, 2) providing Nogales border traffic congestion and queuing information to carriers and shippers. Arizona administrative requirements for commercial vehicles include: vehicle registration, safety verifications, fee payments, tax and insurance compliance, and permit issuance. 2. The purpose of the FOT was to evaluate EPIC technologies and services under actual operating conditions. Formal technical evaluations of operational tests are conducted to ensure that, once the test is concluded, sufficient information will be available to guide future development and deployment decisions.

A Guide to Developing a Regional ITS/CVO Coordination Plan
August 1997

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
4	0	0	4	2	0

SIGNIFICANT FINDINGS
<ol style="list-style-type: none"> 1. A regional ITS/CVO Coordination Plan outlines a strategy for the deployment of Intelligent transportation Systems (ITS)/Commercial Vehicle Operations (CVO) technologies by a group of states with common economic and transportation needs. 2. The plan defines strategies to ensure that future deployments of ITS/CVO systems are consistent with the CVISN architecture and compatible across states. 3. The development of a Regional ITS/CVO Coordination Plan is a critical step toward ensuring safe and efficient commercial vehicle operations nationwide. 4. Regional collaboration facilitates the deployment of interoperability systems that can serve motor carriers who operate in more than one state.

LESSONS LEARNED
<ol style="list-style-type: none"> 1. The model Regional Coordination ITS/CVO Coordination Plan will include an overview of the business planning process, a description of the region, a strategic overview, a program summary, and an approach to organization and management. 2. Producing a Regional ITS/CVO Coordination Plan involves establishing a coordination plan steering committee, defining a strategic overview for the coordination plan, reviewing constituent state ITS/CVO business plans, reviewing other key background documents, defining multi-state projects and documenting the coordination plan in a report.

INSTITUTIONAL ISSUES
None

OPERATIONAL ISSUES
None

ARTICLE SUMMARY / SYNOPSIS
This guide to developing a regional ITS/CVO coordination plan was prepared by Cambridge Systematics for the FHWA. It outlines the necessary steps to developing the plan for deployment of ITS/CVO technologies.

**ITS Sheet 6: ITS Puts Freight Information Ahead of Freight Movement (FHWA-OP-01-013)
2001**

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
4	0	3	0	2	0

SIGNIFICANT FINDINGS
<ol style="list-style-type: none"> 1. First project addresses efficiency and security of freight movement from manufacturer to customer - use of biometric "smart cards" to confirm the identity of the driver using a sorted thumbprint and to provide information about the seal on the cargo, the driver was transporting. 2. The second addresses efficiency and security of freight movement across international borders among trucking and marine carriers. Using electronic container seals to monitor the security of containerized freight across international borders. Helps automate clearance and credentialing of commercial vehicles through ports and terminals.

LESSONS LEARNED
<ol style="list-style-type: none"> 1. Purpose is to decrease congestion, and thus operating costs by providing information that allows freight movement organizations to identify and avoid transportation bottlenecks.

INSTITUTIONAL ISSUES
None

OPERATIONAL ISSUES
<ol style="list-style-type: none"> 1. A seal that meets the requirements of both U.S. and Canadian custom officials has not been found.

ARTICLE SUMMARY / SYNOPSIS
<ol style="list-style-type: none"> 1. Provides a status of two intermodal freight operational tests. 2. Purpose is to decrease congestion, and thus operating costs by providing information that allows freight movement organizations to identify and avoid transportation bottlenecks.

Electronic Cargo Seals: Context, Technologies, and Marketplace - Michael Wolfe, North River Consulting Group
July 12, 2002

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
2	0	2	0	2	2

SIGNIFICANT FINDINGS

- | |
|---|
| 1. E-seals have the potential to improve both freight transportation security and productivity. Very few electronic seals in use today. |
|---|

LESSONS LEARNED

- | |
|--|
| 1. The E-seal market is still in the early stages of development, no one technology has come to the forefront. |
|--|

INSTITUTIONAL ISSUES

- | |
|---|
| 1. Institutional issues include: There is no global frequency set aside for radio frequency identification (RFID). Cost is a major concern to the users - who are concerned with who will pay for the cost. |
|---|

OPERATIONAL ISSUES

- | |
|--|
| 1. Many believe that frequency has inherent performance problems in freight terminals. Many stakeholders feel that the 5800-5900- MHz favored by the ITS community for DSRC, applications is inappropriate for freight terminal and warehouse applications. Users concerns include: Effectiveness - does e-seal perform as advertised and operating practice - business practices would have to be modified with the use of e-seals. Recycling seals would include, removing, collecting, and accounting for devices. This also includes having seals at the correct location. |
|--|

ARTICLE SUMMARY / SYNOPSIS

This article is an overview of the electronic cargo seal market. It provides rationale for electronic seals, types of e-seals, and the current marketplace (price, product development status, future needs).

**Final Report Assessment of Automated Data Collection Technologies for Calculation of Commercial Motor Vehicles Border Crossing Travel Time Delay - Battelle
April 2002**

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
3	0	2	0	3	3

SIGNIFICANT FINDINGS
<ol style="list-style-type: none"> 1. All technologies studied, except one require infrastructure to be installed at on both sides of border. The technology that did not require cross-border infrastructure had other disadvantages. Sensing technology must be able to accurately identify the specific truck, and accurately record the geographical location of the vehicle. 2. No one sensor technology was a clear favorite.

LESSONS LEARNED
<ol style="list-style-type: none"> 1. Selected technology will have to (1) identify specific trucks (2) timestamp vehicles they pass in the upstream and downstream direction (3) collect and process travel time (4) achieve data for further analysis and use by agency and stakeholders. 2. Follow-on studies should include current homeland security concepts.

INSTITUTIONAL ISSUES
<ol style="list-style-type: none"> 1. Installation entails cross-border agreements as well as the expense to install technology on both sides of the border. Issue as to how the U.S. would purchase and install equipment located across the border, although it has been done before.

OPERATIONAL ISSUES
<ol style="list-style-type: none"> 1. Location of sensor and operational coordination between agencies.

ARTICLE SUMMARY / SYNOPSIS
<p>Main Objective of the study was to assess the potential of certain technologies to determine commercial vehicle travel time at border crossings by automated means. Collected truck travel times and calculated delay. Review of assumptions in deploying an automated system. Looked at the feasibility of replacing or supplementing data collectors within the system.</p>

Statewide ITS Architecture Development, A Case Study - Arizona's Rural Statewide ITS Architecture
September 1999

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
4	0	0	4	2	0

SIGNIFICANT FINDINGS
None

LESSONS LEARNED
<ol style="list-style-type: none"> 1. Diverse group of advocates helped assure that user needs were correctly identified. 2. Maintaining coalition momentum was difficult during complex /abstract task of mapping user needs to user services, market and equipment packages. Mapping user needs to National ITS architecture maybe a more expeditious approach. 3. Potential benefits of enhanced stakeholder participation can help justify the costs of procurement.

INSTITUTIONAL ISSUES
None

OPERATIONAL ISSUES
None

ARTICLE SUMMARY / SYNOPSIS
<p>ADOT developed a Strategic Plan for Statewide Deployment of Intelligent Transportation Systems (ITS). The Case Study highlights: (1) using the National Architecture saved time and money, (2) the use of ADOT Community Relations Office assisted by soliciting input from large and diverse group of stakeholders. (3) incorporated input from non-traditional stakeholders such the National Park Service, the National Weather Service and railroad agencies. (4) how lessons learned in prior state ITS developments served as the framework to the statewide effort.</p>

Port-Of-Entry
Marketing Winter Vegetables from Mexico
April 1998

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
1	0	3	1	4	4

SIGNIFICANT FINDINGS
<ol style="list-style-type: none"> 1. The winter vegetables have always accounted for the bulk of the agricultural trade through Nogales during the October-June season. 2. Vegetables for export are produced under contract with distributors in Nogales, Arizona. Producers grow, harvest, and pack the vegetables and then deliver them to the distribution in Nogales. 3. Most of the product travels by temperature-controlled trucks, a small portion by rail, and are loaded at the packinghouses and arrive in Nogales, Mexico the next morning after the 12-18 hour trip. 4. As soon as the truck leaves the packinghouse, information is sent electronically to Nogales to the Customs brokers and the distributors who begin selling the product, often before it has actually arrived. After clearing Mexican and U.S. customs, the trucks deliver their loads to Nogales, Arizona distributors and most of them return to Mexico. 5. The Mexican growers' organization for the state of Sinaloa, Confederacion de Asociaciones Agricolas del Estado de Sinaloa (CAADES), has a section dedicated to supporting the vegetable export industry--the Commission for the Investigation and Defense of Vegetables, which is active in facilitating the export process. 6. Each truck uses both a Mexican and U.S. customs broker to clear customs. A truck must clear Mexican customs and present the export document for record and pay a user's fee. The truck then must clear U.S. Customs. All paperwork has been sent electronically to Customs, USFDA, USDA and the Arizona Department of Motor Vehicles. When the truck arrives the decision has been made on whether to require further inspection.

LESSONS LEARNED
None

INSTITUTIONAL ISSUES
None

OPERATIONAL ISSUES
None

ARTICLE SUMMARY / SYNOPSIS
The US Department of Agriculture supplied this report to discuss how winter vegetables from Mexico are marketed to the United States. This study relies mainly on interviews with a limited number of distributors in Nogales, Arizona, producers in Sinaloa and industry organizations. It also discusses how produce is shipped to Nogales and describes the border crossing process.

**Port-of-Entry Advanced Sorting System (PASS) Operational Test - Final Report
December 1998**

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
4	0	0	3	2	0

SIGNIFICANT FINDINGS
<ol style="list-style-type: none"> 1. A secondary objective of the project was to test the use of "double threshold" WIM scales as an economical method for improving WIM accuracy. 2. Within the scope of this demonstration, benefits included: <ul style="list-style-type: none"> • Improved weigh station personnel productivity and increased enforcement revenues • An automatic and continuous check on weights, licenses, registrations, permits, safety and tax payments • Significant time and operating expense savings for legally operating motor carriers who are pre-cleared • Decline in large truck queues, thereby improving weigh station safety • Elimination of confusing variable message signs and complex signal timing on the main line • Focusing of static weight enforcement and safety inspections on trucks most likely to be in violation of weight or operation regulations • Discouraging unlawfully operating carriers through increased enforcement and time delays, thereby achieving a higher degree of truck compliance and highway safety • Acquiring continuous traffic volume, classifications, and weight data for highway planning and maintenance

LESSONS LEARNED
None

INSTITUTIONAL ISSUES
None

OPERATIONAL ISSUES
<ol style="list-style-type: none"> 1. The conventional mainline sorting system worked well, but there were problems with the variable message signs used to direct the vehicles. 2. The problems were: <ul style="list-style-type: none"> • Truckers still misread signs • The signs also tended to confuse passenger car drivers • Signs require program modifications and are a constant maintenance concern • During inclement weather and on heavily traveled or multi-lane highways, variable message signs can prove ineffective 3. A significant issue in mainline sorting is the accuracy of high-speed WIM scales: they are required to allow trucks at legal weight to bypass the static scales and still reliably detect overweight trucks -- To prevent unnecessary diversion of heavy but legally loaded trucks, WIM accuracy must be improved.

4. The accuracy of a WIM system tends to increase more or less proportionately with the cost of the system. Differing technologies are used by existing WIM systems, each offering a different level of performance at a different level of cost.

ARTICLE SUMMARY / SYNOPSIS

The principle objective of the project was to demonstrate the feasibility of integrating state-of-the-art, AVI, WIM automatic vehicle classification (AVC), and on-board information systems to identify, weigh, classify and direct selected heavy vehicles in advance of weigh stations and Ports-of-Entry.

Assessment of Truck Travel Time & Delay at 7 International Ports-of-Entry - Report Summaries

MEASUREMENT OF COMMERCIAL MOTOR VEHICLE TRAVEL TIME AND DELAY AT U.S. INTERNATIONAL BORDER STATIONS (2001)

[HTTP://WWW.OPS.FHWA.DOT.GOV/FREIGHT/PMEASURE/INDEX.HTM](http://www.ops.fhwa.dot.gov/freight/pmeasure/index.htm)

RELEVANCE					
ITS	CVISN	CUSTOMS	STATE	FEDERAL	INTERNATIONAL
0	0	0	0	3	0

SIGNIFICANT FINDINGS

1. Time needed for processing commercial vehicles entering is significantly longer than departing at every location. Control substance and illegal immigration inspections on Southern border required reviews of incoming cargos and their operators that led to unavoidable time delays.
2. Actual extent of delays encountered in both directions and reasons for them varied by individual port-of-entry.

LESSONS LEARNED

1. Results of the study will help the agency engage with other Federal, State and local jurisdictions in constructive dialog on how they collectively all can improve the security and mobility at the Ports-of-Entry.

INSTITUTIONAL ISSUES

None

OPERATIONAL ISSUES

None

ARTICLE SUMMARY / SYNOPSIS

HAW reviewed the crossing activity to provide a baseline measure of border crossing travel time and delay for commercial vehicles transiting the port-of-entry. This would assist shippers in more consistent predictors of crossing times they may encounter at major locations and identify possible actions that relieve some of the delay now occurring.